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Injuries of and Operations upon the Kidney.

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INJURIES OF AND OPERATIONS UPON THE KIDNEY[1]

BY [illegible], M.D.

The heart, lungs and kidney have been aptly called the three legs of the human tripod. Destroy or impair the integrity of any one of these three, and the vital [illegible] is broken. Consequently, whatever interferes with the proper physiological function of these organs, be it disease or injury, must always be of the highest interest to the practitioner. When the interference comes from an injury or can be remedied by surgical devices, the interest and attention of the surgeon is at once engaged. Of these three organs, up to the present time, with one or two exceptions in favor of the lungs, surgery has had only to do with the kidneys, and that of comparatively recent date.

I propose first to speak of injuries of the kidney, and secondly of operations upon it.

The kidneys, although so snugly and deeply ensconced in the body, are in that part of it which is naturally exposed to many dangers. Vehicles, car buffers and the like are about the right height to strike that portion of the body containing these organs, and their injury is no uncommon thing. Falls, compression between two unyielding bodies, blows, a falling mass, are generally the causes which produce the accident. Muscular strain may do it, and I have seen a comparatively light blow from a boxing glove produce one of the most characteristic signs of the injury, hematuria. The injury may be slight or severe;

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[1] Read before the Surgical Section of the Suffolk District Medical Society, May 4, 18[illegible].

a simple contusion or bruise, or a multiple laceration. It may be subcutaneous, or communicating with an open wound. The peritoneum may or may not be involved. All parts of the kidney have been torn and lacerated; the most dangerous portion to be injured is the pelvis with the renal vessels.

The diagnosis of a subparietal injury can generally be pretty surely determined, but not always, as one of the cases which will be cited later testifies. We have as signs, the nature and circumstances of the accident; pain, more or less intense over the injured kidney; hæmaturia generally; retention of urine and retracted testicle sometimes; a tumor in the loin, dull on percussion, rarely occurs; and if the injury is a severe one there are the ordinary signs of shock and collapse. Of course there are many variations and combinations of these symptoms, and, as I have said, all or nearly all, may be absent. The prognosis, of course, depends upon the severity of the accident, and the amount of injury the kidney has sustained. If a simple contusion or bruise, as illustrated by the first case I shall presently give, the symptoms soon disappear and the patient is well. In lacerations, where the kidney is ruptured or crushed, the case is different, but even here authorities agree with Mr. Harrison, who says that "lacerations of the kidney is a lesion more frequently recovered from than any corresponding one of an internal organ."

Maas[2] gives an interesting series of experiments upon animals where the kidney was artificially ruptured or incised, and the number of recoveries are noteworthy. By incision into the kidney no fatal result ensued. In certain cases where he severely ruptured the kidney; atrophy of the injured organ followed, and the remaining kidney performed the functions of both. In other cases cicatrization without subsequent symptoms followed; and in still others hydronephrosis and abscess resulted with necrosis of a great part of the kidney substance. In these experiments the most prominent symptom of rupture was hæmaturia. Maas[3] has also collected seventy-one cases of kidney injury, of which thirty-seven recovered and thirty-four succumbed, but of these thirty-four he says in only sixteen is the injury itself to be looked upon as sufficient cause of death. Bloch[4] records forty cases with twenty-three deaths, and Simon[5] ten, with seven deaths. I have collected twenty-seven cases (1879 to 1887) with eleven recoveries and sixteen deaths. Adding these twenty-seven cases to Maas' seventy-one [Maas probably included the cases of Bloch and Simon in his number] we have ninety-eight cases with fifty deaths or a mortality of 51.02 per cent. (for subcutaneous injuries.)

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[2] Klinische und Experimentelle Untersuchungen uber die Subcutanen Quetschungen und Zerreisungen der Nieren, Deutsche Zeitschrift für Chirurgie, Vol. X. 1878.

A fatal result in an injury of the kidney may be caused by hemorrhage, either primary or secondary, peritonitis, suppuration, abscess, and concomitant lesions of other organs. Maas in his cases found primary hemorrhage as a cause of death relatively seldom. The treatment of the more severe cases — laceration and rupture — demand particularly our attention, for the question of surgical interference may come up. The cases of little gravity get well of themselves, with rest and expectant treatment.

Knowing, then, that the crush, blow, or fall over the kidney was a severe one; having profuse hæmaturia, intense pain in the loins, symptoms of collapse and the general signs of severe hemorrhage; we can feel sure that we have to do with a ruptured or lacerated kidney, which may involve both the renal vessels and the peritoneum. What is to be done? The first thing, obviously, is to arrest the hæmorrhage, and without operative interference only indirect means can be used to accomplish this. Of the first importance is perfect and prolonged rest in bed; a disregard of this cardinal principle was followed with disastrous results in one of the cases reported, as you will see. The best external application is an ice-bag. Morphia subcutaneously or opium per anum must be given to alleviate pain and restlessness. Then comes the internal administration of astringents, and I should doubt if any of them do much good. They are ergot, tannin, gallic acid, acetate of lead, iron, matico, hydrastis, hamamelis, rhus aromatica, and others. The food should be liquid like milk and ice, and no stimulants should be given. Intestinal and gastric activity are to be reduced to a minimum. Catheterization may and probably will be required, and if the bladder is filled with clots, Mr. Morris suggests breaking them up with a lithotrite. The plan suggested by Dr. F. N. Otis[6] for dissolving clots in the bladder, by injecting into it a pepsin solution (a drachm of pepsin to two or three ounces of water), seems to me to be worthy of trial. Cystotomy may have to be performed to give exit to the clots, as was done in a case of Mr. Rawdon's, reported by Mr. Morris.[7]

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[3] Loc. cit.

[4] Bloch, [illegible] Thèse, Paris, [illegible]

[5] Simon, Chirurgie der Nieren, II. Theil, Stuttgart, [illegible]

If, in spite of these means, the hæmaturia continues, and an increasing anæmia and collapse, accompanied perhaps with dulness and swelling in the loin, indicates that the hæmorrhage is still active, and a probability that the pelvis of the kidney has been involved, the only resource left is surgical interference. Simon's[1] points, which seem sufficient for an operation, are *strong collapse* and *swelling* in the region of the injured kidney.

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[6] "Genito-Urinary Diseases and Syphilis," by F. N. Otis, M.D., New York, 1883, p. 166.

[7] Surgical Diseases of the Kidney, Henry Morris, p. 111.

This operation should be either an abdominal or lumbar incision; the latter is the one to be at first thought of and done, and only in case one fails in this way to reach and tie the source of the hæmorrhage, or there are clots in the peritoneal cavity — the peritoneum having been torn — is abdominal section to be considered. A previous lumbar incision in no way prejudices a later abdominal one, so far as I can see. Moreover, the operation should be done, as Mr. Reeves[2] says, "before the patient is too weakened by hæmorrhage, and before septic phenomena have been allowed to develop."

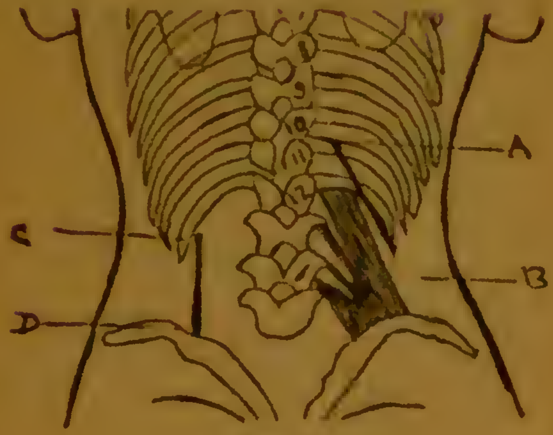

Fig. 1.

For injuries, the vertical incision (Fig. 1, C D), seems the most natural one, over the swelling if it exists, if not, from just below the twelfth rib to the crest of the ilium, along the external border of the quadratus lumborum muscle, or about three inches from the spine. If more room is desired, a second incision can be made from near the top of the vertical one outwards, about one-half an inch below the twelfth rib;

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[1] Loc. Cit.

[2] The Lancet, Oct. 4, 1884.

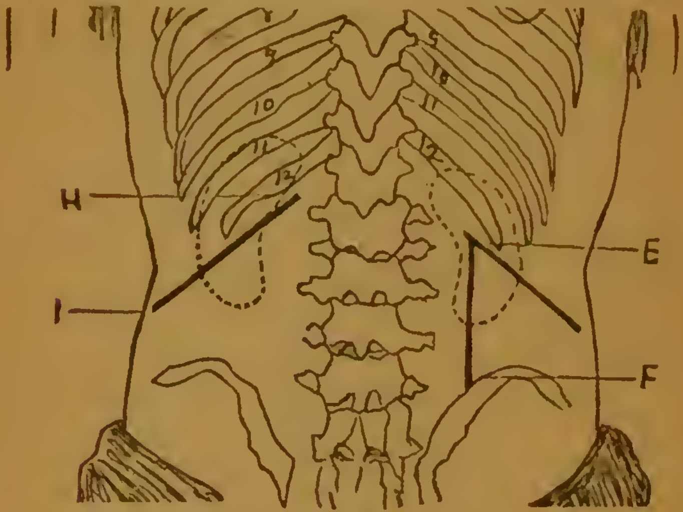

FIG. 2.

the whole incision will then be in the form of an inverted L (Fig. 2, E F). The ribs can also be strongly raised by retraction. The oblique incision, as in nephrotomy, is also equally good. The kidney, or what remains of it, having been reached, all clots, effused blood, and debris are to be removed, and the cavity thoroughly cleaned with an antiseptic fluid. The source of hæmorrhage is to be sought for and ligated. In cases of such serious gravity as to call for an operation, the pelvis of the kidney will probably be broken into and the renal vessels injured. These with the ureter should be ligated and the renal remnants removed; a nephrectomy done, which procedure receives the sanction of both Mr. Reeves[10] and Mr. Morris.[11] "Nephrectomy will in future," says the latter, "be probably adopted as giving the best prospect for recovery." That it has been done many times up to the present date, for wounds and lacerations, I find no evidence, and can only refer to five cases cited by Dr. Weir[12] in which it was done, and successfully so in three.

If the hæmorrhage has been stayed, an immediate operation, at least, is not indicated, but there are other dangers to be guarded against. Peritonitis is one, which, if it occurs, is to be treated in the usual way; or, knowing that it is of traumatic origin, abdominal section may properly be thought of. Extravasation, suppuration, and pyonephrosis are other late dangers, indicated by general constitutional symptoms, fever, rigors, etc., and often dulness and a tumor in the loin. All of these three last conditions call for lumbar incision and drainage. "If the kidney, by suppuration, is structurally destroyed, it is to be removed."[13] If the symptoms do not give clear evidence of fluid beneath, aspiration can first be resorted to. Septic decomposition in the bladder is still another danger, and, for its relief, washing out the organ with antiseptic solutions is required, or even cystotomy.

Compound fractures or injuries of the kidney are caused by firearms and penetrating instruments. They are rare in civil life. There are two symptoms which, if present, are pathognomonic of a wound of the kidney — hæmaturia and escape of urine from the wound. Of course, there are cases in which the evidences of an injury of the kidney are not clear, and only accumulate later.

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[10] Loc. cit.

[11] International Encyclopedia of Surgery, Vol. V, p. 676.

[12] New York Medical Journal, Dec. 27, 1884, Vol. XL, p. 721.

[13] Injuries of the Kidney. R. Clement Lucas, Lancet, I, 1884.

The dangers are the same as in subparietal injuries, and are to be combatted in the same way. An operation may be demanded, as in the other class of cases, and under similar circumstances. In the seventy-eight cases reported in the medical and surgical history of the War, twenty-six recovered. Nephrectomy or nephrotomy was not done in any case; probably more cases would have been saved if they had been. "If life be threatened by hæmorrhage or suppuration, the kidney ought to be removed by lumbar nephrectomy."[14] The external wound should be treated on general antiseptic principles.

I am aware that I have only given, in relation to injuries of the kidney, about what are the opinions and experience of all modern surgeons. The one point I wish to emphasize is the recourse to an operation — lumbar or abdominal incision, with nephrotomy or nephrectomy, and ligature of the ruptured vessels, when other means fail to control the hæmorrhage — and the doing of this just as soon as it is evident that the bleeding is jeopardizing the life of the patient. Also, if the danger from primary hæmorrhage is past, a later operation of the same kind for suppuration, extravasation, or pyonephrosis.

In concluding this part of my paper, I can, perhaps, make it more vivid by giving a few illustrative cases from among those I have collected.

ILLUSTRATIVE CASES.

CASE I. My own. A student was thrown violently down in a game of foot-ball. Severe pain in the lumbar region, over the kidney, and hæmaturia followed; also some difficulty in micturition. Rest in bed, poultice over the loin, and ergotin were prescribed. The hæmaturia ceased in one or two days. He grew rapidly better, and in a week or ten days was up and about. Several weeks after the accident he reported himself as feeling perfectly well. This illustrates one of the lighter forms of injury, and might, perhaps, be called a bruise of the kidney.

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[14] Morris. Loc. cit.

CASE II. Reported by W. Martin Campbell.[d] Supposed rupture of the kidney. A boy of fourteen years, in leaping over a hedge, struck first on his feet, and then fell and rolled over on his left side. He picked himself up, and walked some distance. There followed shock, intense pain over the left kidney, and more or less profuse hæmaturia, which disappeared in a few days. Later, some rise of temperature for a few days. The treatment was perfect rest, liquid diet, gallic acid, and opium, with ice over the injured kidney. The ice was the only thing which relieved the intense pain, which returned as soon as it was removed. In a microscopic examination of the urine, blood, casts and traces of broken tubules were found.

The pain disappeared in two days, and he was sitting up in seven days. He became and remained entirely well. The author bases his diagnosis of rupture upon the immediate violence of the symptoms, the amount of blood lost, and the presence of blood casts and broken tubules. He further adds that "the differential diagnosis between rupture and contusion is by no means easy, nor for treatment is it essential."

CASE III. Reported by W. Y. Fisher.[e] Crush and rupture of the kidney. The accident was caused by a mass of coal falling upon the patient. The injury was followed by collapse, intense pain in the right lumbar region on deep breath, and hæmaturia. Death occurred sixty hours after the accident, from anæmia and shock.

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[d] Liverpool Medico-Chirurgical Journal, 1884, Vol. IV, p. 128.
[e] Lancet, March 14, 1885.

On autopsy, a large quantity of blood was found in the peritoneal cavity, and behind the right kidney there was an enormous amount of blood-clots and effused blood. The kidney itself was, in its upper half, smashed to a pulp, and, in its lower half, was a small, deep, jagged wound. No wound of the trunk artery or vein was detected. The ureter was blocked by blood-clots.

One thinks of an operation in a case like this as soon as the hæmorrhage was seen to be alarming, but, in the light of the autopsy, only an abdominal section would probably have offered any chance of success.

CASE IV. Reported by W. Jas. Spence.[17] Rupture of the kidney; death on the forty-seventh day. The patient was struck in the right flank by the revolving handle of a travelling crane, and knocked down a cutting some sixteen or seventeen feet deep. Collapse ensued, with pain and hæmaturia. An ice-bag was applied to the loin, and opium given. The hæmaturia continued more or less profusely for eight days, when it subsided under large doses of iron. On the nineteenth and twentieth days after the accident, the patient sat up for two or three hours each day. On the twenty-first day hæmaturia recurred, and, with two days intermission, continued until he died of exhaustion, forty-seven days after the accident. Lead, ergot, turpentine, and other remedies were tried without avail.

At the autopsy, a rent was found in the medullary substance at the upper part of the right kidney. This rent was filled with a decolorized and partly-organized clot. The pelvis of the kidney, the ureter, and bladder, were distended with blood-clots.

Here, again, was not an operation indicated when the secondary hæmorrhage occurred, and all other means to stay it had failed? Incidentally, the case shows the disastrous effect of movement, for all was going well when the patient sat up.

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[17] Medical Times and Gazette, 1885, I, p. 9.

Case V. Reported by T. W. Stokes.[17] The patient was crushed between the buffers of two cars, and was supposed to have sustained a laceration of the liver, no symptoms pointing to an injury of any other organ. The urine was drawn, and found clear. Pain not very intense, and chiefly confined to the region of the liver. Death occurred four days after the accident. At the autopsy, besides extensive injury to the liver, the right kidney was found to be extensively torn, the lacerations running transversely, and extending almost to the sinus, but not in it, which, the author thinks, accounts for the absence of hæmaturia. The kidney tear was completely sealed up and in process of healing, its edges being glued together by lymph. The immediate cause of death was secondary hæmorrhage, probably from one of the lacerations of the liver.

The case is interesting, as showing the process of repair in a badly lacerated kidney, and the absence of almost all the signs of a rupture of that organ. The author's reason for the absence of hæmaturia was probably the correct one.

Case VI. Reported by M. Mauroury.[18] A carter was crushed between his cart and a post. The day after the accident, he noticed that his urine was bloody, but he paid no attention to it, and in a few days resumed his work. Hæmaturia, however, continued, and finally retention followed. He applied to a pharmacist, who catheterized him. Later, fever appeared, and other serious symptoms, and he entered a hospital. Here evidences of extensive suppuration were found, and a tumor detected in the left lumbar region. Aspiration showing pus, a lumbar incision was made; giving exit to almost a quart of pus, mixed with fragments of renal tissue, the total mass of fragments weighing nearly two ounces. The vast cavity was washed out, and an antiseptic dressing applied. Healing was complete in about a month and a half.

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[17] Dublin Journal of Medical Science, 1880, Vol. LXIX, p. 93.
[18] Revue de Chirurgie (Paris), 1885, V, p. 448.

It is marvellous that, with so serious a laceration as this evidently was, the symptoms, at the first, should have been of so little intensity.

OPERATIONS UPON THE KIDNEY.

Two cases occurring in my own practice, the one fatal, and the other full of suffering, have indelibly impressed upon my mind the importance of surgical interference in certain affections of the kidney, notably calculus and suppurative lesions, as affording the only deliverance in otherwise hopeless cases. The one case was that of a young married man, who, for years, suffered from symptoms of renal calculus, enduring the most excruciating and convulsive pain of renal colic, and for which he vacillated between opium-eating and rum-drinking, becoming a curse to himself and his unhappy family. The other case[20] was also that of a young man just beginning a professional career, from which he had much to hope, afflicted with a suppurative affection of one kidney. After dragging out a wretched existence for two years, he died of pyæmia, and the autopsy revealed an enormously dilated, pus-secreting sac in the place of the kidney. Both of these lives, I believe, might have been restored to usefulness and comparative health through the intervention of surgery.

To Simon, of Heidelberg, and Morris, of London, the surgical profession is indebted for firmly establishing the operations of nephro-lithotomy and nephrectomy, nephro-lithotomy having been first performed

[20] Boston Medical and Surgical Journal, March 27, 1884.

by the latter in 1880, and nephrectomy by the former in 1869.

Besides these two operations, with which the remainder of this paper will be chiefly concerned, we have nephrotomy, nephrorraphy, paracentesis, and what Mr. Lucas[26] makes a distinct operation, exploration of the kidney, which is but a part of nephro-lithotomy.

Within the last few years, recorded cases of operations upon the kidney have been rapidly multiplying, and the literature upon the subject is becoming voluminous. Gross's[27] paper, based upon an analysis of nearly four hundred and fifty cases of all kinds, containing all he could collect up to May 15, 1885, is well known to you.

I have collected, of cases recorded since that date, sixty-eight operations of all kinds as follows:[28]

Nephrectomies, 28 with 6 deaths, 21.42%. Of these 18 were lumbar with 2 deaths, 11.11%; and 8 abdominal, with 4 deaths, 50%; the incision in two cases was unknown. Nephrotomies, 13 with 4 deaths, 30.77%. Nephro-lithotomies, 21 with 2 deaths, 9.52%. Exploration, 2 with no deaths. Nephrorraphy, 4 with no deaths.

Of these sixty-eight cases, thirty-two were for calculus, in which nephrectomy was done nine times, with one death; nephrotomy twice, with one death; and nephrolithotomy twenty-one times, with two deaths. I have added these cases to Dr. Gross's, and give a synopsis of the results.

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[26] British Medical Journal, September 26, 1885.

[27] American Journal Medical Sciences, July, 1885.

[28] Operators: [illegible], Hingston, [illegible], Pozzi, Colquhoun, [illegible], Bryant, [illegible], Thornton, Elder, Lucas-Championnière, [illegible], Whitehead, [illegible], Doutrelepont, C. Mac Namara, [illegible], Walsham, [illegible], Page, Wright, [illegible], Israel, [illegible], [illegible], [illegible], Willett, Clark, Tait, [illegible], Brooks, Page, Lloyd, [illegible], Agnew, Greene, [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], Lucas, Israel, [illegible], Wagner, [illegible], [illegible], Morris.

Synopsis of Gross's Cases with Sixty-eight Additional Ones Added Thereto, Collected since May 15th, 1885, the Date of his Paper.

	No. of cases	Recovered	Died	Per cent. died
Nephrectomies both lumbar and abdominal for all causes . . .	261	153	110	42.14
Nephro-lithotomy . .	42	38	4	9.52
Nephrotomy (lumbar)	116	89	27	23.28
Nephorraphy	22	21	1	4.54
Exploration	31	31	0	0
Suppurative Lesions from all Causes.				
Nephrectomy	90	55	35	38.88
Nephrotomy	101	79	25	24.04
Incisions.				
Lumbar	129	86	43	33.33
Abdominal	128	63	65	50.78

The indications and technique of nephro-lithotomy and nephrectomy have been carefully discussed by surgeons of all countries, and, at the present time, the tendency is toward a greater precision in diagnosis, and earlier surgical interference.

With regard to the indications for nephrectomy, for a broad rule, Simon's [24] is a good one: that when a reasonable certainty exists that one kidney is healthy, and the other is the seat of advanced and irremediable disease, its extirpation is justifiable.

Nephrectomy, says Wagner,[25] is urgently indicated in cases in which the renal lesion directly threatens life. As, for instance, in cases of severe injury of the organ, and malignant disease. In suppurative affections, if the disease be progressive, has caused emaciation and hectic fever, and is likely to be associated with general amyloid degeneration. Braun * adds cases of fistula of the ureter which cannot be healed, and injuries of the kidney, where an open wound permits a clear recognition of the injury. He finds, further, that nephrectomy for malignant tumors give bad results, while, on the contrary, the results from this operation for pyelitis and pyelo-nephrosis are remarkably good, he having obtained twenty-three complete recoveries from thirty-eight operations. In hydro-nephrosis, he is in doubt whether a fistula or extirpation is the better procedure. Gross, and many others, held that nephrectomy should not be resorted to as a primary operation in suppurative lesions, but only after a previous nephrotomy. No hard and fast rule can be laid down, it seems to me, but the surgeon must be governed in his decision very much by the condition of the case and patient. One thing is certain, that nephrectomy is being more frequently done every year; and Tillaux's ** opinion, that it is an operation which ought to be reserved for very exceptional cases, is receiving a less rigid interpretation.

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[24] Chirurgie der Nieren.

[25] P. Wagner. Casuistische Beiträge zur Nierenchirurgie. Deutsche Ztschr. f. Chir. (Leipzig), 1886, XXIV, 505-592.

It is, of course, a very serious matter to leave the patient with only one kidney, ignorant as the operator is of the exact condition of that one, or, in fact, if it exists, though this last risk is a small one, for out of eight thousand and sixty-six post-mortem cases, according to Mr. Morris, there were but two instances of congenital absence, and one only of congenital atrophy of the kidney. That a single kidney is capable of eliminating sufficient urine for the maintenance of health, is sufficiently well established; that it so increases its functional powers as to perform the full amount of work formerly performed by the two kidneys, seems to me to be extremely doubtful. At all events, the man with one kidney is very like the showman with his head in the lion's mouth, who calls out: "Is he wagging his tail? for, if so, it is all over with me." If this one kidney is attacked with disease, it is likely to be all over with him.

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* Ueber die Indicationen zur. Nephrectomie. Centralblatt für Chirurgie, No 11, 1882.

** Anatomie Topographique, Troisième édition, p. 780.

The majority of the nephrectomies have been done through the loin, the extra-peritoneal operation. It is generally the ovariotomists and gynæcologists who favor the abdominal method. For instance, Knowsley Thornton maintains that the abdominal incision does not add much to the risk of the patient, if the surgeon will make his abdominal exploration thoroughly aseptic. Mr. Lawson Tait[28] says he does not think it matters much whether the organ be attacked by what is called the abdominal method, or the lumbar. The general surgeon, however, favors the extra-peritoneal operation, and thus far, the statistics show a much less mortality. The advantages of the abdominal operation are a larger field of operation, with all that means, which is, of course, of immense importance, and an examination of the diseased organ and its relations, as well as the other kidney, if possible, if the conditions of the case render this important.

I will briefly sketch the technique of the lumbar operation: The latero-abdominal position is to be chosen, and a cushion or pillow placed under the flank, so as to make prominent the field of operation. Simon's original incision (Fig. 1, A B), largely in use now, was made along the outer edge of the quadratus lumborum muscle, two-and-a-half to three inches from the

[28] Birmingham Medical Review, September, 1885.

spinous processes of the lumbar vertebræ, extending from the superior border of the eleventh rib to the middle of the space between the twelfth rib and the iliac crest. Many surgeons* have modified this; Braun, Czerny, Clement Lucas, Morris, Kuhnenberger, Polaillon, and others. Vertical, oblique, and curved incisions have all been made. Watt says a vertical incision (Fig. 1, C D) from just below the twelfth rib to the crest of the ilium, about three inches from the spine, affords ample room for a nephrectomy of a normal kidney. The incision which would seem to me the most satisfactory, as affording the most room, is the inverted L one thus, Γ (Fig. 2, E F), which is made as follows:

First, an oblique incision, like that for colotomy, within about one-half an inch of the last rib, and parallel to it, is made, about four-and-a-half inches long. A second incision runs vertically down from the first, beginning at or near its posterior extremity, along the outer edge of the quadratus lumborum muscle, and extending to the iliac crest. Mr. Morris advises leaving the second incision until the kidney has been exposed, and then it can be made by cutting from within outwards with a probe-pointed bistoury, guarded by the index finger of the left hand. Polaillon's incision, which is recommended, is the reversed L one, thus ⅃, the vertical incision being the outer one, and the transverse branch forwards parallel to the last rib. The next step in the operation is laying bare the kidney, and the third, separating the organ from its surroundings. The last, which Simon says is the hardest and longest, is tying the pedicle and cutting loose the kidney, which Mr. Lucas also says is the chief difficulty in the operation. Whether the pedicle is to be tied *en masse* or by separate ligatures, must depend upon circumstances and the creed of the surgeon.

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* Le Dentu. Technique de la Néphrectomie. Revue de Chirurgie, No. 1, 10 Janvier, 1881.

The operation accomplished, the cavity is to be washed out with an antiseptic fluid, a chloride-of-zinc solution, for instance, one or two drainage-tubes inserted, the wound closed, and an antiseptic dressing applied. The accidents of the operation are injury of the peritoneum, hæmorrhage, cut or tear of the colon, and wounding of the pleura. In suppurative affections, also, there is great danger from adherence to neighboring organs, as terribly illustrated in a case of Billroth's quoted by Guyon,[*] where the inferior vena cava and right renal vein were ruptured, even with the more ample room of an abdominal incision.

Peritonitis and septic peritonitis, Guterbock[41] says, are unknown as sequelæ to lumbar nephrectomy, but pyæmia and septicæmia are more frequent than after abdominal nephrectomy.

Nephrotomy (lumbar) is substantially an incision into an abscess sac or cyst, often a preliminary operation to nephrectomy. If there is a tumor in the loin, this will be the guide for the incision, which is similar to that for lumbar colotomy, only a little posterior to it. It is slightly oblique in the ilio-costal interspace, beginning over the outer border of the erector spinæ, and continued forward for three or four inches. The operation is an extremely easy one, says Mr. Tait. The table of statistics shows that it is a less dangerous operation for suppurative lesions than nephrectomy; and, being first done in this class of cases, robs a subsequent nephrectomy of much of its danger.

Marchetti's[42] celebrated case, fairly well substan-

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[*] De la Taille Rénale. Annales des Maladies des Organs Genito-Urinaires, March, 1887.

[41] Centralblatt für die Med. Wiss., November 21, 1887.

[42] A Contribution to the History of Nephro-Lithotomy, by Howard Downes. Medical Times and Gazette, I, 1885, p. 258.

[illegible], which happened way back in the seventeenth century, about [illegible], might, I suppose, be added to modern nomenclature, a case of nephrolithotomy. Besides the interest which the case itself evokes, it is so attractive in its quaint style, as related by Charles Bernard, and incidentally in the glimpses of character of both surgeon and patient, that I will give an abstract of it. It was the case of a Mr. Hobson:

"This gentleman, who was consul for the English at Venice, having been afflicted with a stone in the kidney" (note the accuracy of his diagnosis the account does not state), "was at length attacked with a fit of that duration and violence, that it reduced him almost to desperation; and, finding no relief from any means that had been used, he determined to apply himself to Dominicus de Marchettis at Padua, a famous and experienced practitioner there, the son of Peter, both well known in the learned part of their profession. To this person, Mr. Hobson, under the greatest extremity of pain imaginable, addressed himself, requesting of him that, having made use of all conceivable means, and the best advice that was to be had in Venice, without success, he would be pleased to cut the stone out of his kidney, in his belief that no other method remained capable of relieving him, adding that he was not insensible of the danger, but that death itself was infinitely more eligible than a life in that misery under which he had long, and did then groan. Marchetti seemed very desirous to have declined it, representing not only the extreme hazard, but, as he feared, the impracticableness of the operation, that 'twas what he had never attempted, and that to proceed to it was, in fact, to destroy him. But, Mr. Hobson persisting that, if he refused it, he would never desist 'til he found out one who would do it, Marchetti was at length, by his resolution and importunity, prevailed upon to undertake it; and, having prepared himself as he thought convenient, he began with his knife, cutting gradually upon the region of the kidney affected so long, till the blood disturbed and blinded his work so, that he could not finish it at that attempt, wherefore, dressing up the wound till the next day, he then repeated and accomplished it by cutting into the body of the kidney, and taking thence two or three small stones, he dressed it up again. From this instant, he was freed from the severity of his pain, and, in a reasonable time, was able to walk about his chamber, having been in no danger either from flux of blood or fever. Marchetti continued to dress the wound for a considerable time, but was not able to close it up, it soon becoming fistulous from the continual flowing of the urine through the sinus; but, being in all other respects restored to health and vigor, and the matter discharged being little, he took leave of the Professor, and returned to Venice under the care and management of his wife, who, one morning, as she was dressing the sore, fancied she felt something hard and rugged as she wiped it, upon which, examining a little more carefully with her bodkin, which served her instead of a probe, she found it to be a stone of the figure and magnitude of a date-stone, which, being removed, he never after complained of the least uneasiness in the part."

When, through the irritation of the calculus, an abscess is formed, and a tumor appears, and we have calculous pyelitis, "then, indeed," said this same Charles Bernard, "the necessity and reason of the operation are so obvious, and the difficulty so little, that no man ought to decline it." But an operation before the calculus[83] "has occasioned destructive changes, which are liable to terminate in the death of the patient, whether he be abandoned to nature's efforts, or be afforded a chance by a resort to the knife." That is to say, an operation, as a preventative measure, is the thing to be desired. But here comes in, alas! the difficulty in diagnosis, which, in the majority of cases, is conjectural only.

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[83] Philadelphia Medical News, April 25, 1885, Vol. 46, p. 459.

The signs of renal calculus which warrant a lumbar exploration of the kidney, says Mr. Chavasse,[illegible] are: (a) blood in the urine; (b) unilateral pain passing down the ureter towards the testis; (c) pain elicited by deep-seated pressure in the lumbar region, between the last rib and the iliac crest, just external to the erector spinæ muscle; (d) the presence of uric-acid and oxalate-of-lime crystals in the urine. Moreover, he adds, the surgeon is justified in an exploration in those cases of chronic nephralgia depending on uncertain causes, which (which rest and medicine have failed to remedy); and, even if no stone is detected, instances have been recorded in which prolonged relief has been obtained.

Paroxysmal lumbar nephralgia and hæmaturia, both aggravated by exercise, pain shooting from loin to groin, and testes, with retraction of the testes, is a classical group of symptoms of great reliability, says another.[illegible] In still another case operated upon, the symptoms were occasional acidity of the urine, appearance and disappearance of pus, pain in the region of the left kidney, and hæmaturia.

Mr. Owen[illegible] operated and found a calculus in a case where the symptoms were pain in region of the spermatic cord, running down the thigh, with urine often thick and bloody.

[illegible] "Renal Surgery." Lancet (London), February [illegible], 18[illegible].

[illegible] Gaston Lloyd: "Personal Observations in Kidney Surgery." Birmingham Medical Review, [illegible], 18[illegible].

[illegible] British Medical Journal, 18[illegible], II, p. [illegible]

In Mr. Morris's first case, the symptoms were attacks of renal colic and hæmaturia.

Dr. Gross[37] says the best diagnostic symptoms of renal calculus are intermittent attacks of renal colic, with tenderness on pressure; the presence of blood; and, perhaps, a little pus in the urine, with frequency of micturition. "This group of symptoms being present," he says, "the surgeon is certainly warranted, after the failure of ordinary remedies to relieve them, in cutting down upon the kidney, through the loin, with a view to its exploration with the finger, a needle, and, if needed, by an incision of the kidney-substance itself, through which the finger can be carried into the calices and pelvis of the organ."

The position of the calculus in the kidney, whether in the pelvis or substance, has been thought[38] to make a difference in the symptoms, which would seem natural. If the calculus were in the pelvis of the kidney, there would probably be pus in the urine, and the symptoms would be more severe and more constant than if the stone were in the substance of the organ. As the dangers from nephro-lithotomy are not great — in sixty-three examples of attempted and accomplished nephro-lithotomy, there were only three deaths, or 4.76 per cent.[39] — it would seem to be sound surgery to cut down upon, and explore the kidney, whenever the symptoms are such as to give reasonable expectation of finding the calculus. Suppose the surgeon does find himself deceived in his diagnosis, he has caused his patient no great risk, for, in twenty-nine cases collected by Dr. Gross,[40] in which the kidney was cut down upon, and in four of which it was cut into, and no stone found, all recovered.

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[37] Transactions of American Surgical Association, Vol. III, 1885.

[38] Nephro-Lithotomy, by J. Chiene. British Medical Journal, February 7, 1885, Vol. I.

[39] Gross. Philadelphia Medical News, December 18, 1886.

[40] Ibidem.

That surgeons are more and more following the lead of Mr. Morris every day, is manifest from the increasing number of recorded cases; and, in the future, it is to be hoped that they will be eager to relieve their patients, through operative interference, from the intolerable agony of renal colic from calculus, and not wait to be implored by them in desperation, as Mr. Hobson did Marchetti. "The wise surgeon," says Mr. Morris, "will not wait too long, expecting the *vis medicatrix naturae* — a force which, with renal calculous disorders, as with so many others, too often ends by handing over the patient to the sombre solicitude of the undertaker."

The incision for nephro-lithotomy (Fig. 2, II) has generally been made parallel to the last rib, from one-half to an inch and a-half below it, beginning at the edge of the erector spinae muscle, and extending from three to four and a-half inches. This incision may be supplemented by a vertical one, as in nephrectomy, if more room is desired, or the simple vertical lumbar incision may be sufficient. When all hemorrhage is stopped, the edges of the wound being held widely apart with retractors, the perirenal fat is to be torn through; and, when the kidney is reached, the finger carefully explores the posterior surface of the organ, the abdominal walls of the patient, meantime, being well supported by an assistant, or pillow. If nothing indicates the presence of a stone on the posterior aspect, the anterior surface is to be explored next, the kidney being pressed backwards by the finger which is exploring the front surface. If the result is negative a fine needle is to be passed into the renal substance in various directions, so as to puncture the calices of the kidney.

Finally, an incision may be made into the calices, and the interior of the kidney explored with finger or probe. The stone, being found, is best removed by the finger, if possible; if not, by forceps. The operation completed, a drainage-tube is to be inserted, the wound closed, and an antiseptic pad or dressing applied. The dangers — not great — of the operation to be kept in mind are hæmorrhage, cellulitis, renal abscess, and fistula. Healing is generally rapid.

In conclusion, I desire to express my sincere thanks to Dr. Chadwick for the loan of much valuable literature upon the subject.

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MORTALITY STATISTICS OF NEPHRECTOMY AND NEPHROLITHOTOMY

NEPHRECTOMY

Lumbar Incision.				Abdominal Incision.			
By whom collected	No. of Cases	Deaths	Per cent.	Authors	No. of cases	Deaths	Per cent.
Gross	111	41	[illegible]	Gross	[illegible]	[illegible]	[illegible]
Brodeur	[illegible]	47	[illegible]	Brodeur	[illegible]	[illegible]	[illegible]
Harris	[illegible]	18	[illegible]	Harris	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	13	[illegible]	[illegible]	[illegible]	18	[illegible]
[illegible]	24	7	29.16	[illegible]	[illegible]	13	[illegible]
Otis	18	2	11.11	Otis	8	4	[illegible]
Average per cent., 31.48.				Average per cent., 54.44.			

NEPHRO-LITHOTOMY.

Authors	No. of cases	Deaths	Per cent.
Gross	21	2	9.52
Brodeur	36	8	22.22
Otis	21	2	9.52

Average per cent., 13.75.

NOTE.—The same cases are probably included in many of the lists, but this does not make so much difference where only an estimate of the mortality in each operation is desired and the average of all the per cent. is taken.

No.	Lesion.	Reference.	Reporter.	Result.	Remarks and Symptoms.
1	Bruised right kidney.	[illegible] 1877, [illegible]	[illegible]	Recovery.	Hæmaturia for four days.
2	Lacerated kidney from fall of a horse.	[illegible]	[illegible]	Death.	Bladder contracted and empty. Right kidney lacerated almost beyond recognition.
3	Rupture of kidney from fall.	[illegible] 1879, N. S., [illegible]	[illegible]	Recovery.	Hæmaturia ceased on the morning of 3d day. Nearly well on 19th day.
4	Possible rupture from fall.	British Med. Journal, Sept. 1, [illegible].	[illegible] Ward.	Recovery.	Hæmaturia and pain; was well in eleven days.
5	Rupture of right kidney from fall.	Lancet, [illegible]	[illegible]	Death.	No hæmaturia; on autopsy the kidney found ruptured along its transverse diameter below its centre; the upper fragment having attached the ureter and renal vessels.
6, 7, 8	Three cases of ruptured kidney.	Lancet, [illegible]	[illegible]	Death.	In two cases symptoms not noted. Hæmaturia in the third, autopsies in all showed rupture.
9	Rupture [illegible] from fall of [illegible]	[illegible] Journal, [illegible]	W. [illegible]	Death (from [illegible])	No hæmaturia; kidney extensively torn, but not extending into the [illegible].
10	Laceration of kidney from fall.	[illegible] Journal, [illegible]	E. H. [illegible]	Death.	Hæmaturia.
11	Laceration [illegible] from [illegible]	St. Louis [illegible]	J. S. [illegible]	Death.	Hæmaturia. On autopsy the left kidney found badly lacerated.
12, 13, 14	Three cases of probable rupture.	[illegible] Med. Journal, [illegible]	[illegible]	[illegible]	Hæmaturia in all, in one very severe.
15	Complete rupture of left kidney.	[illegible]	[illegible]	Death.	No hæmaturia; phenomena of internal hæmorrhage.
16, 17, 18	Three cases of [illegible] of the kidney.	[illegible]	[illegible]	[illegible]	Hæmaturia in two cases; absent in one.
19	Rupture of [illegible]	[illegible]	E. B. Ward.	Death.	No hæmaturia; upper portion of left kidney found ruptured.
20	Rupture of liver and of kidney from fall.	[illegible] Hospital Reports, [illegible]	W. H. [illegible]	Death.	Hæmaturia. Right kidney ruptured in two places.
21	[illegible] wound of [illegible] kidney.	[illegible] Journal, [illegible]	[illegible]	Recovery.	Late hæmaturia. Collapse and almost death from hæmaturia on [illegible]th day.
22	Severe injury of right kidney.	Lancet, [illegible]	H. [illegible]	Death.	Bladder also ruptured.
23	Contusion and rupture of kidney.	Rev. Med. [illegible], 1884, xvi, [illegible]	[illegible]	Recovery.	
24	Rupture.	[illegible]	[illegible]	Death.	Continued hæmaturia. Death from secondary hæmorrhage on the forty-seventh day after the accident.
25	Tear of kidney.	Rev. Med. [illegible]	[illegible]	Recovery.	
26	Tear [illegible]	Rev. Chir., Paris, [illegible], v, 418.	[illegible]	Recovery.	Hæmaturia. Suppuration. Incision.
27	[illegible] from fall of [illegible]	[illegible]	G. Y. [illegible]	Death.	Hæmaturia. Upper half of right kidney [illegible] to a pulp.

In these [illegible] cases there were seven recoveries and [illegible] deaths, and in [illegible] death occurred in two from other causes.

[illegible]